

The Cased Theory – A Philosophical Lateralization On Developing Contribution To Knowledge And Originality In A Phd Thesis: An Illustrative Example Of Poverty Reduction Through Boreholes Provision In The Atebubu And Afram Plains Districts Of Ghana

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Abstract

Several studies emphasize the ‘Contribution to knowledge’ as an essential ingredient in classical research leading to awards of PhDs. In some recent PhD defences the obvious lack of clarity on this issue leaves observers with inconclusive expectations as to what constitutes ‘Contribution to knowledge’ and its essential hallmark of Originality. In essence, there should be least ambiguity about Contribution to knowledge and what constitutes Originality in every research work finalized. Discussing the issue with several students and some past PhD candidates, the major challenge seems to lie with the lack of a clear process and standard guidelines to follow to measure what constitutes originality in new knowledge generation. So there is the tendency to outline technical field findings as original contribution to knowledge. This leaves many gaps especially in relation to the philosophical underpinnings of knowledge generation which constitutes the heartbeat of any academic discourse at that highest level. In this discourse, the author discusses and illustrates the process termed as ‘the CASED Theory’ for generating contribution to knowledge and validating originality of contribution to knowledge in assessing research work by PhD students. The hope is that this mythical area in PhD research will be resolved once and for all, especially in the field of Social Sciences. This will help to address the current prevalent hiatus and ambiguity relating to contribution to knowledge and its originality.

Key words: CASED Theory; Contribution to knowledge; Originality; Axiology; Theory of Change; Epistemological metamorphosis; Ontology.

1. Introduction

It has been indicated that the most essential ingredients in a good thesis include the contribution to knowledge, originality, research results and outcome (Dunleavy, 2003). Similarly, it has also been emphasized that the two key criteria commonly employed to define a PhD submission are ‘Originality’ and ‘Contribution to knowledge’ (Tinkler and Jackson (2004:117).

‘Originality’, in terms of being original, creative or innovative, is one of the most frequently stipulated criteria for the award of a PhD. However, what constitutes originality and how much of a thesis should be ‘original’ to qualify for a PhD is still an indeterminate factor. ‘Originality’ therefore has become an all embracing term that academics interpret in diverse ways. Thus, ‘originality’ in PhD thesis can take several forms in relation to its novelty or the creativity that has been exhibited or proof that the research work in question never existed before (Twigg, 2003; Jackson & Tinkler, 2001).

Originality in research has been classified into three main areas: (i) research topics; research processes; and research outcomes (intentional and unintentional). They further indicate that originality in research topics encompass: ‘research on new areas of study, data sets, questions, hypothesis, problems, and so on. (ii) for research processes ‘originality’ involves new applications of established research tools for instance methods, instruments, conceptual tools, modes of analysis, procedures, theories, practice – to different or new research topics. Also significant refinement of established research tools, applied to established or new research topics, and also the application of new perspectives to research topics. (iii) originality in research outcomes which may be intentional or unintentional involves, new or substantially revised solutions, products, theories, knowledge, interpretations, approaches, ways of doing research (methods, instruments, conceptual tools, modes of analysis, procedures, applications of theory, ‘practice’); new synthesis of theory or knowledge or ways of doing research; the opening-up of new and/ or neglected areas for fundamental and significant further research; and the proof that a candidate is a ‘self-directed scientist’ adds credibility and relevance in this subject area (Tinkler & Jackson, 2004; Phillips & Pugh, 2000).

The requirement that a thesis should represent a contribution to knowledge is usually coupled with the criterion that it should be original/new and distinct. Therefore, this study seeks to enrich the on-going debate on developing contribution to knowledge and originality, and especially at 'originality' as it spontaneously emerges as part of the natural process in the development of 'Contribution to knowledge' in a PhD Thesis.

2. Problem Statement

For many universities of high repute, the doctorate program is a very important medium for assessing original contribution to knowledge in the Social sciences as they help form and manage the intellectual capital of civilization. In essence, form and character, each and every doctoral thesis must be unique. Thus, in universities 'originality' and a major 'contribution to knowledge' to the discipline being studied by a student constitute key requirements for awarding doctorate degrees (Dunleavy, 2003). In that respect, it is very essential for students researching at the doctoral level to read extensively and master the literature in the specific subject area and be at the cutting-edge of related knowledge to be able to effectively contribute and in original dimensions.

From its inception to finish students at the doctoral level must know and be clear in their minds what the research is about; what contribution they intend to achieve; and, what will be unique about their thesis. They are expected to show 'novelty' or 'originality' by exercising their independent critical power in reviewing literature and analyzing data that supports a broader understanding of their disciplines of study (Ruger, 2011; Dunleavy, 2003). Tinkler and Jackson have indicated that as with originality, a contribution to knowledge can be rather elusive for PhD students in some areas of the Social sciences. They have further indicated that the characteristics of a 'standard' thesis include: 'Scholarship' defined in terms of 'originality', coherence, a 'sense of student autonomy or independence'; and, 'evidence of critical reflection'. Also, they are of the view that the hallmark of a researcher should essentially be in originality, independence, thinking critically, theoretical conceptualization, and being able to analyze and evaluate critically own research findings as well as from other persons (Tinkler and Jackson, 2004).

Some Examiner's guidelines for assessing a PhD thesis identifies two key overall attributes of the thesis as: 'Contribution to knowledge' and 'Originality and creativity', being a new world view developed or constructed. They indicate that these must be verifiable. The Verifiability principle states that anything that cannot be verified, through empirical observation cannot be considered to be scientific knowledge (Ayer, 1952).

From the descriptions and reflections above, the issue under review concerns how all the authors have stated and described what 'contribution to knowledge' and 'originality' should be and as a standard or a critical and essential requirement which must be seen in a PhD thesis. However, none of them indicated a clear, structural process to follow in developing the contribution to knowledge and the associated originality. This discourse attempts to resolve this gap through the CASED Theory.

3. What is the CASED Theory?

The CASED theory is a process of developing contribution to knowledge and originality and validating them in the course of developing a Doctor of Philosophy (PhD) thesis. CASED is an acronym which makes up the five constituents elements of the new knowledge generation process and explained as:

- Collection and Collation - Knowledge gathering through literature reviews and field studies and assembling information – facts and figures.
- Amalgamation - knowledge comparatives and mixing from the several sources or the intellectual scaffolding process.
- Synthesis – a conflation of old and new knowledge for new knowledge construction through reviewing of existing sources and analyses of empirical data.
- Evolution - emergence of new knowledge from the knowledge conflation and construction process.
- Distillation - epistemological metamorphosis through rigorous methodological and critical thinking processes to arrive at a refined theory/logic model as Contribution to knowledge, and which, of its kind and nature can be termed as 'original'/novelty.

3.1 Evolution of the CASED Theory

The CASED Theory has philosophical underpinnings from and based on the four axis of the Transformative Research paradigm as shown in Figure 1. The four axis are: 1.Axiology 2. Methodology 3. Epistemology 4. Ontology (Mertens, 2009; Bunge, 2001).

The path or trajectory of developing and validating Contribution to knowledge and its 'originality' in a PhD thesis starts from the endpoint of the theoretical framework of a study – implicit and explicit in the Theory of change. That is, at the impact level. The five basic elements of the Theory of Change are: 'Inputs (the financial, human and material resources used for development interventions, which are used to generate the Processes (actions taken, through which inputs are utilized to produce specific achievements) as Outputs (the products, capital goods and services that result from development interventions), and resulting in Outcomes (the short-term and medium-term effects of processes showing as interventions outputs, and change in development conditions), leading to Impacts (actual or intended changes in the quality of life of people)' (UNDP, 2009).

The Change theory shows the sequential trajectory of processes culminating in Outcomes and Impacts. The Processes indicate the basis of the change(s) occurring and explains the causes underpinning the interventions in logical causative paths (Gertler, et al, 2011). Thus, Contribution to knowledge thus emerges in its original raw form as a technical element where the impacts that emerge are practical changes in the human development experience, and as measured and demonstrated by the progressive well-being of people or otherwise. Impacts mainly capture the changes in the lives of people over a timeframe. Though most often assumed as positive, the changes are transformational and could be positive or negative or both over the timeframe used as point of reference in the study.

As the next step, the student passes the end-product of the study (stated as Impact) through the four axis of the Transformative Research paradigm as stated and shown in Figure 1. In terms of axiology, the research student identifies the ethical issues which under-girds the study. Axiology constitutes the ethical actions based on ethics of subject under study, which in this study are social and economic justice; gender, human rights, environmental congeniality, and human security issues. The axiological assumption also identifies and respects cultural norms that support human development aspirations; respects community entry protocols; recognizes and validates local knowledge, expertise, and strengths in a community; recognizes limitations in relation to respect for respondents views and privacy of information volunteered by respondents (Mertens, 2009; Bunge, 2001).

Further, Methodology refers to the appropriate approach to systematic inquiry, being the systematic application of conventional research methods to collect and analyze data relating to the research topic. Methodology carries the assumption about appropriate approaches to systematic inquiry employed in the research. It implies the rigorous approach used to collect, process and analyze data about the reality of the concept under review so that the student-researcher feels assured that the relevant situational reality has been captured and it was carried out in an ethical manner, and that the results so obtained can be validated (De Leeuw, et al, 2008; Guisepe, 2006).

Epistemological applications relates to knowledge, the methods used to generate knowledge, and the degree of knowledge validation. Epistemology is foundational to all research and it plays a fundamental and essential role in methodologies that promote the social justice agenda. The epistemological assumption acknowledges that knowledge is socially and historically located and should be respected as such (Kovach, 2010; Bunge, 2001). Within the confines of epistemology, the student-researcher critically examines the nature of the results obtained from both literature reviewed and the empirical data collected and analyzed.

Ontology basically refers to reality. Ontology shows the new reality that emerges to vindicate the axiology. In essence, ontology or the new emerging reality from a study, actually constitute the new contribution to knowledge which can be validated or refuted through the application of the CASED Theory. In every good study new reality emerges from extensive review of literature, and the analysis and interpretation of empirical data collected.

The new reality can be seen and accepted as privilege and universal or parochial and compromised reality. The ontological assumption recognizes that different versions of reality exist, and that all versions of reality are not equal. It recognizes privilege given to what is perceived to be real based on social, economic, gender, religion perspectives, and makes visible versions of reality that have the potential to further human rights and social justice aspirations (Donaldson & Mark, 2009).

In the broader context of research, ontology addresses social and economic justice and human rights, freedoms and gender equality issues with the ability to resolve challenges/problems such as relates to human security, human development issues relating to poverty, and inequalities in regional spread of social and economic development initiatives in a country (World Bank, 2006). Also, the practical appreciation that reality is shaped and evolves by socio-cultural, political, ethnicity and race, and economic factors that strongly influence and determine which reality

is considered as privilege and universally acceptable or skewed and parochial in research conclusions (Wilson, 2008; Vaughan & Buss, 1994).

3.3. Developing ‘Contribution to knowledge’ by using the CASED Theory Model

As depicted in Figure 2, the process starts by picking the end products of the Theory of Change in a study. These end-products are the Impacts which are passed through the four axis of the Transformative Research paradigm as applied to new knowledge emerging from the Theory of Change. The resulting ‘Contribution to knowledge’ and its ‘originality’ are validated with the CASED Theory.

The model as depicted in Figure 2 have the following elements:

Collection and collation of knowledge: Collecting ideas about the research topic through literature review and primary data collection.

Amalgamation: piecing together ideas, information, raw data and gives specific direction for analysis of data collected for the study. The two axis of knowledge collation or collection and amalgamation constitutes the intellectual scaffolding stage where the props needed are erected to enable the construction of the foundations and superstructure of new knowledge.

Synthesis: Mixing of ideas, including data collected and analyzed. It involves intellectual conflation of knowledge through critical thinking processes, re-casting knowledge with new insights, reflections, and discussions; and looking-out for relationships and inter-relationships and practical applications – both narrow and broad. The process of intellectual scaffolding leads to intellectual architecture (infrastructure) building, which crystallizes and culminates in specialized technical intellectual knowledge which can be articulated as reality in geographic space for the benefit of humanity. The process can be a homogenous or diverse fusion of knowledge in an accelerated form through concentrated or relational critical thinking on the subject, data and information so far accessed by the student-researcher.


Evolution: Interpretation of emerging epistemologies (knowledge) from study.

The Synthesis and Evolution axis also together constitute the Intellectual architecture building phase of the new knowledge generation.

From the Synthesis and Evolution axis there is the intentional anchorage to the foundations of knowledge in the subject area – that is back-referencing to the foundational authors critical to the knowledge synthesis and generation process for comparison and contrast to establish the way forward.

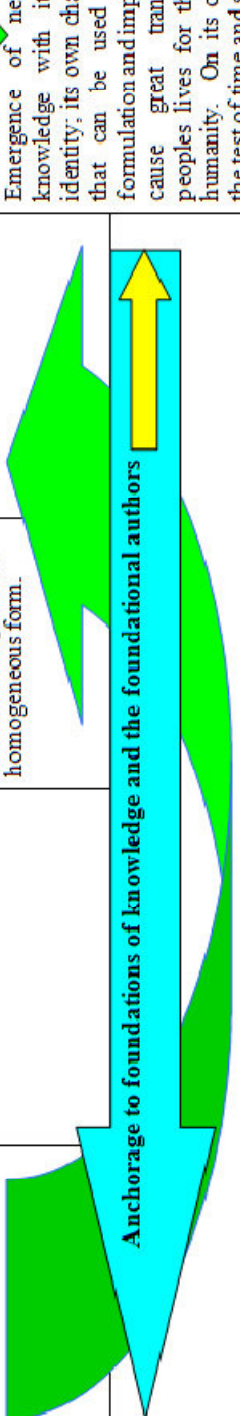
Distillation: involves application of intellectual rigor to new realities and refining of final product till new knowledge is generated through the process of epistemological metamorphosis which involves the structural homogeneous transformations of knowledge into new reality. This phase constitutes the Intellectual articulation stage and exhibits new homogeneous knowledge, with its own organic identity, character and spirit that can be used through policy formulation and implementation to cause great transformations in peoples’ lives for the betterment of humanity. On its own it can stand the test of time and space.

Figure 1: THE FOUR AXIS OF THE TRANSFORMATIVE RESEARCH PARADIGM

1.		2.		3.		4.	
AXIOLOGY		METHODOLOGY		EPISTEMOLOGY		ONTOLOGY	
Ethical actions based on ethics of subject under study: <ul style="list-style-type: none"> • Social Justice • Human Rights • Economic justice • Creating environmental congeniality • Human Security 		The appropriate approach to systematic inquiry = the systematic application of conventional research methods to collect and analyze data relating to research topic.		Knowledge generated through acceptable methodology and validation processes and compared or added to existing body of knowledge in the field of study. Relation between knower and would-be-known.		The new reality that emerges to vindicate the axiology. This reality can be privileged or compromised.  The reality within geographic space: <ul style="list-style-type: none"> • Social justice attainment. • Economic emancipation and economic empowerment. • Human rights equities attainments. 	
THE FREEDOMS PROCESS IN GEOGRAPHIC SPACE: <ul style="list-style-type: none"> • Physical freedom: boreholes provision leads to eradication of waterborne related diseases = people released from disease burden = released also from time loss due to disease = substantive freedom gained = Health freedom, which is the key to everything else. • Time freedoms = time saved from trekking from fetching water applied to occupational livelihood activities to earn income; facilitating quality education delivery; and children's ability to regularly attend and participate in school effectively. • Economic and social freedoms through capacity and capabilities attained to foster improved quality of life for progressive reduction in poverty over the long haul. 							
Freedoms: <ul style="list-style-type: none"> • Substantive • Instrumental For continual improvement in quality of life and development; and progressive reduction in poverty.							

Source: Authors Construct

Figure 2: THE CASED THEORY – A PHILOSOPHICAL LATERALIZATION ON DEVELOPING CONTRIBUTION TO KNOWLEDGE & ORIGINALITY IN A PhD THESIS

C		S		E		D	
COLLECTION		SYNTHESIS		EVOLUTION		DISTILLATION	
AMALGAMATION		BUILDING OF INTELLECTUAL ARCHITECTURE		EPISTEMOLOGICAL METAMORPHOSIS		INTELLECTUAL ARTICULATION	
INTELLECTUAL SCAFFOLDING	Collecting of ideas about the research topic through literature reviews and primary data collection.	Piecing together of ideas, information, secondary and primary data. This gives specific direction for data analyses and interpretation.	Mixing of ideas, including analyzed data information. Looking-out for relationships and inter-relationships and practical applications – both narrow and broad contexts. Conflation of old and new knowledge into a homogeneous form.	Interpretation of emerging epistemologies from output of Synthesis process. Intellectual re-casting with new insights, reflections, and discussions. Anchoring to foundational authors on the subject under study.	Application of intellectual rigor to new realities and refining of final product till new knowledge is generated and new realities emerge. Epistemological metamorphosis involving the structural transformation of knowledge into new reality.	 <p>Emergence of new homogenous knowledge with its own organic identity; its own character and spirit that can be used through policy formulation and implementations to cause great transformations in peoples lives for the betterment of humanity. On its own it can stand the test of time and space.</p>	
<p>Anchorage to foundations of knowledge and the foundational authors</p> <ul style="list-style-type: none"> • The anchorage to foundations of knowledge in subject area: anchoring to the foundational authors or the authors critical to the knowledge synthesis and generation process for comparison and contrast to establish the way forward. • The process of intellectual scaffolding leads to intellectual architecture building, which crystallizes and culminates into a steady flow of sustainable intellectual articulations made concrete or a reality within geographic space for the benefit of humanity. 							

Source: Author's Construct

4. Empirical Illustration

The CASED Theory Model as applied to the development of the Freedoms Platforms Concept in Geography and Rural Development.

To be able to contribute to knowledge in a study, and in an original way, it is best to start by identifying what is at stake. For instance, ‘access to potable water in rural life’, and on that basis carry out extensive literature review. Then select those who ought to be substantially involved or affected – the Stakeholders and from them collect your empirical data.

For instance, as to what the stake is in boreholes provision, it is known and affirmed that it creates platforms for release of substantive freedoms which facilitates progressive poverty reduction by: eradicating ill-health from target population; provides time gains through good health due to consistent patronage of boreholes from not going searching for water, and improvement in gender status. Time gains as applied to occupational livelihoods to break poverty thresholds, improve quality of life and reduce poverty; enable children to be enrolled and be punctual and regular at school; and Empowerment: involving capacity enhancement; capability acquisition; instrumental freedoms attainment; and the triumph over place-of-birth disadvantage or adverse geographical factors posing limitations to human development and aspirations (Adow, et al, 2013).

4.1 The Freedoms Platform Concept In Geographic Space:

Physical freedom: boreholes provision leads to eradication of waterborne/related diseases; people released from disease burden; released also from time loss due to disease; substantive freedom gained; health freedom gained, which is the key to everything else. Time freedoms: time saved from trekking from fetching water is applied to occupational livelihood activities to earn income which facilitates emergence from poverty. Economic and social freedoms through capacity and capabilities attained to foster improved quality of life for progressive reduction in poverty over the long haul (Adow, et al, 2013).

This study examined the impact of boreholes provision as illustrative of the post-intervention conditions of life in rural households in the Atebubu and Afram Plains Districts of Ghana. Also, based on three of the domains of geography - location, place, and people-environment relations, the study further sought to establish patterns of the freedoms that emerged as a result of boreholes provided serving as platforms, catalysts and enablers for progressive poverty reduction in the same districts.

In terms of methodology, primary data were collected from communities sampled (in both Program and Control communities), using an integrated approach of quantitative and qualitative data collection methods (Brewer, 2006; Bamberger, 2000). The data collected from the Control communities located in the study area, served as the counterfactual evidence for effective impact analyses. Information were collected on the situation before and after boreholes were provided, as they related to the prevalence of water-borne/related diseases, capacity for engaging in livelihoods occupations and the status of school enrollment and attendance by children. The sample selected for the study was carried out through probability sampling methodology. Non-parametric data analyses methods were employed in the analysis of the data (Guiseppe, 2006; Kreuger & Neuman, 2006). This study employed the use of descriptive statistics. The sampling frame was based on a database of boreholes drilled by World Vision in two districts – Atebubu and Afram Plains. World Vision Ghana Rural Water Project drilled 363 boreholes in 249 communities in the two districts (World Vision Ghana, 2003).

Thirty-two per cent of communities with boreholes (Program communities) were sampled by application of the simple random sample technique. This gave a total of eighty (80) communities with boreholes (Atebubu - 41; Afram Plains - 39). Thirty-four (34) communities in the same geographical area without boreholes were sampled as Control communities (Atebubu – 20; Afram Plains – 14). Fifteen respondents were selected from each program community to arrive at a households respondents sample size of 1,200. Six hundred (600) respondents were also sampled by the simple random technique from the 34 Control communities. Most questions were structured in the form of Likert scale, while other questions asked respondents were structured with responses in basic ‘Yes’ or ‘No’ formats. The quantitative data were analyzed through the use of SPSS computer-based analysis applications to generate the results, while Content analysis method was used to analyze the qualitative information gathered. The unit of analysis was ‘households’

From the community meetings held with respondents during the field survey for this study, listening to community members recount their past experiences of the physical fatigue related to searching for water, incapacitation by water borne/related illnesses such as guinea worm and diarrhea, and the social and economic deprivation they have endured, then it is understandable why they will not compromise and lose the substantive freedoms they have gained as a result of boreholes provided in their communities. In this instance the substantive freedoms gained include freedom from want and fear, freedom of worship, time freedoms, and freedom of mobility, water security assurance, and human security.

The importance of good health to poor people cannot be overemphasized because physical health is vital for the types of livelihood (agriculture) on which they depend and they worry immensely about the prospect of illness which is costly in terms of lost time and earnings. The incidence of waterborne diseases such as guinea worm infection, diarrhea, acute stomach ailments, schistosomiasis, and trachoma were prevalent prior to the provision of boreholes, and this was problematic to the inhabitants of the Atebubu and Afram Plains Districts.

In terms of practical experiences, this study has revealed freedoms that empower children to access and have quality education, thus offering them hope and a future out of poverty (Mertaugh, et al, 2009; Mulkeen & Danden, 2008; Patrinos, et al, 2008). Freedoms and benefits that now cements marriage bonds in these communities, freedoms of celebrating and worshipping God, freedoms of strengthened social cohesion, and health freedoms from incapacitating and debilitating diseases such as guinea worm, trachoma and diarrhea (Pruss-Ustun, et al, 2008).

Freedom of mobility, freedom of time gains and freedom from time poverty are also evident and confirmed in studies by La Frenierre, (2009), and Blackden & Wodon (2006). Also the freedoms of improving economic opportunities, capacity for wealth creation, and the seemingly unlimited potentials for capability development were evident (UNDP, 2006; Sachs, 2005). Thus, the results from this study demonstrate how boreholes provided in rural communities became the platforms that empowered and facilitated freedoms of capacity and capability empowerment for progressive poverty reduction.

4.2 The Freedoms Platform Concept in Geography and in Rural Development: Model 1: Figure 3.

Model 1 depicts the situation within geographic space before boreholes were provided. As Inputs, the prevalent *status quo* in community life was patronage of surface water sources. These were rivers, streams and ponds as sources of water for households. In this scenario, elements of the physical environment determined every aspect of human life, with the prevalent actors termed as environmental resistances (Zimmerman, 1964), environmental determinism (Gourou, 1966), adverse geography (Sachs, 2005), and place-of-birth disadvantage (World Bank, 2006). The basis of this model is that, poor health and hygiene in rural communities, in part, is due to the lack of potable water for domestic use. Among the many water borne/related diseases associated with poor health in rural households are guinea worm, trachoma and schistosomiasis. Poor hygiene practices also attract diarrhea, trachoma, typhoid and skin diseases such as yaws and scabies. These diseases incapacitate the rural population and deplete their labor capacity, causes low productivity and their inability to sustain income earnings. These conditions results in their being entrenched in poverty (Bartram, 2008; Mba & Kwankye, 2007).

In terms of Outputs, the model depicts acute lack of potable water that cause lack of freedoms with manifestations as poor health, incapacitation with water borne/related diseases, and time poverty, resulting from the incapacitation. Poor occupational livelihoods activities also show in very low labor productivity with very low returns and incomes. Acute time poverty manifests with the extensive trekking in search of water daily. Time poverty also shows in the very low participation of children in school, as they go searching for water. There are no trained teachers in communities for lack of potable water. Poor academic results and children unable to transit to higher level of education is the prevalent situation. There is also low social cohesion and low level mobility in terms of economic and social exchanges (Bartram, 2008; Abadzi, 2007).

Outcomes on the model are depicted as a phenomenon of Disempowerment, characterized by prevalence of income and capability poverty.

Income poverty show as a total lack of economic capacity as associated with lowly paid occupations on the job market, poor incomes and people settling in the poverty trap. Capability poverty indicates the lack of specialized skills, resulting in poor participation in the national labor force and job market (Sachs, 2005).

Acute time poverty also led to total lack of gender freedoms for women and children. Disempowered people are evident and shown as households which are unable to take initiatives to improve their well being due to chronic environmental constraints operating to their disadvantage. Disempowered communities are evident as people lacking capacity to mobilize and organize to improve on the constraints they live in (Bamberger, 2001; Nussbaum, 2005).

On the model, Impacts manifest as prevalent issues characterized by total lack of substantive freedoms, endemic generational poverty, constraints and limitations due to acute time poverty, and limited mobility for economic and social exchanges. Also, there is very limited access and very poor quality of basic education. Community life is commonly associated with high level illiteracy, and life cycle disadvantages resulting from illnesses due to lack of potable water.

The quality of life is very poor and associated with low life expectancy. Insecurity and fear pervades everyday life. There is also social inferiority; and gender development and aspirations are virtually non-existent.

4.3 The Freedoms Platform Concept in Geography and in Rural Development: Model 2: Figure 4.

The second Model depicts the change within geographic space in rural communities due to boreholes provided as an intervention to solve the problem of lack of potable water sources. The Inputs are: boreholes provided serving as

platforms, catalysts, and enablers. The underlying processes are that: there is consistent patronage of boreholes; and boreholes continual maintenance and repairs. Boreholes thus become the platforms, catalysts and enablers for freedoms acquisition which show as outputs.

Outputs show as: Substantive freedoms gained with the following elements: health and personal hygiene improvements through consistent patronage of water from boreholes. Freedoms gained with eradication of water borne diseases (such as guinea worm); constraints of physical environment reduced. Health regained channeled into expansion of occupational livelihoods activities. There is also expansion and diversification of occupational livelihoods, increased labor productivity, increased production, increased earnings and wealth creation, investments as demonstration effects, improved quality of life, and progressive poverty reduction.

Time gains – from recovery from ill-health, and not trekking in search of water are used to strengthen and expand occupational livelihoods engagements to earn income, high level economic exchange, and subsequent wealth creation.

Time gains – with boreholes in or around communities, children gain time fetching water for their households and are able to effectively participate in school. Children's attendance in school becomes regular and punctual. Children's attention deficits reduce. Children's absenteeism drastically reduces, and also children dropping out of school decreases. Child-teacher contact hours improve and lead to effective teaching. Improvements in children's academic output and achievements are evident. Children are able to transit to higher levels of the education structure and this creates the potential for entry into the job market at gainful levels, with the ability to distance them from poverty.

Enabling environment – boreholes in communities attracts trained teachers to accept postings to rural communities to stay and teach. Teacher-child contact hours increase. Social freedoms – there is high level mobility within community and to other communities for economic and social exchanges. Underlying processes: Utilization of substantive freedoms gained within geographic space – (communities in rural districts) leading to outcomes.

The Outcomes are captured as: EMPOWERMENT and EMPOWERED:

EMPOWERMENT refers to capabilities acquisition which entails utilization of financial capacity gained to acquire skills to improve and diversify livelihood occupations so as to become less vulnerable to the dictates and influences of the physical environment.

Also, there is livelihoods diversification through new skills and capabilities acquired. EMPOWERED refers to the transformations that have occurred in economic and social forms. Economic transformations show as occupational livelihoods engagements; income earnings and wealth creation; improved quality of life with demonstration effects; and reduction in poverty.

Social transformations involve: education quality improvements, improvements in social cohesion, time gains used in gender empowerment, especially, girl-children empowerment to fully participate in school. There is also stability in marriages in communities. The underlying processes involve: Empowerment applications in geographic space leading to impacts.

The Impacts refer to the Instrumental Freedoms achieved which lead to: sustained poverty reduction manifesting as enhanced wealth creation and investments; enhanced demonstration effects – showing the capacity and ability to access and pay for all basic needs; and, sustained improvement in quality of life. Education/Professions acquired show very high economic rate of return on the value of labor.

Socio-cultural: Life enhancement and enabling opportunities: physical expansion of households – housing; population growth in communities through births, and in-migration. Then also we have: Capacity and capability acquired to resolve all limiting factors relating to adverse geography and place-of-birth disadvantage; and, Contributors to the annual national gross domestic product (GDP) growth (Adow, et al, 2013).

Figure 3: Theory of Change: The Freedoms Platform Concept in Geography and in Rural Development - Model 1

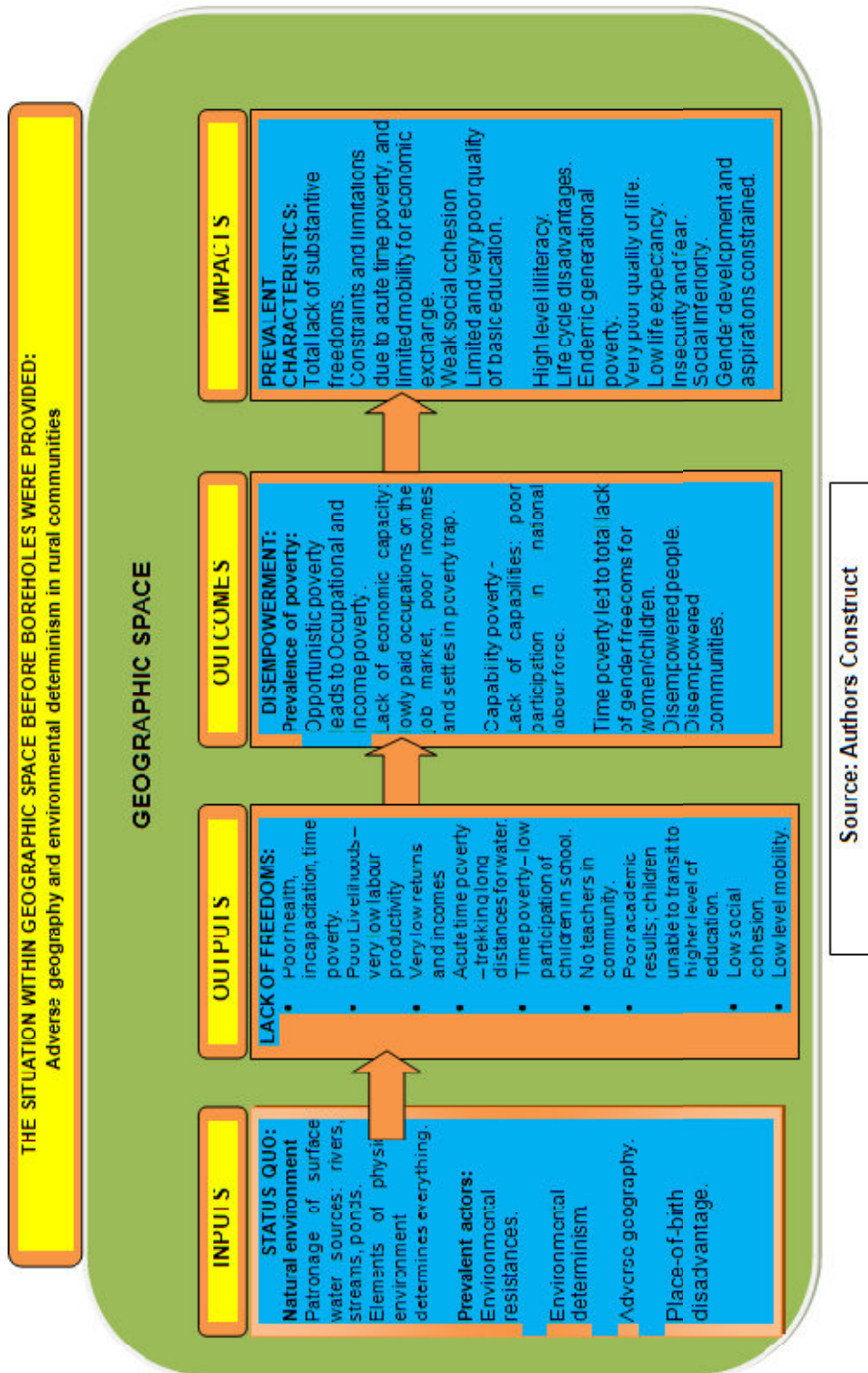
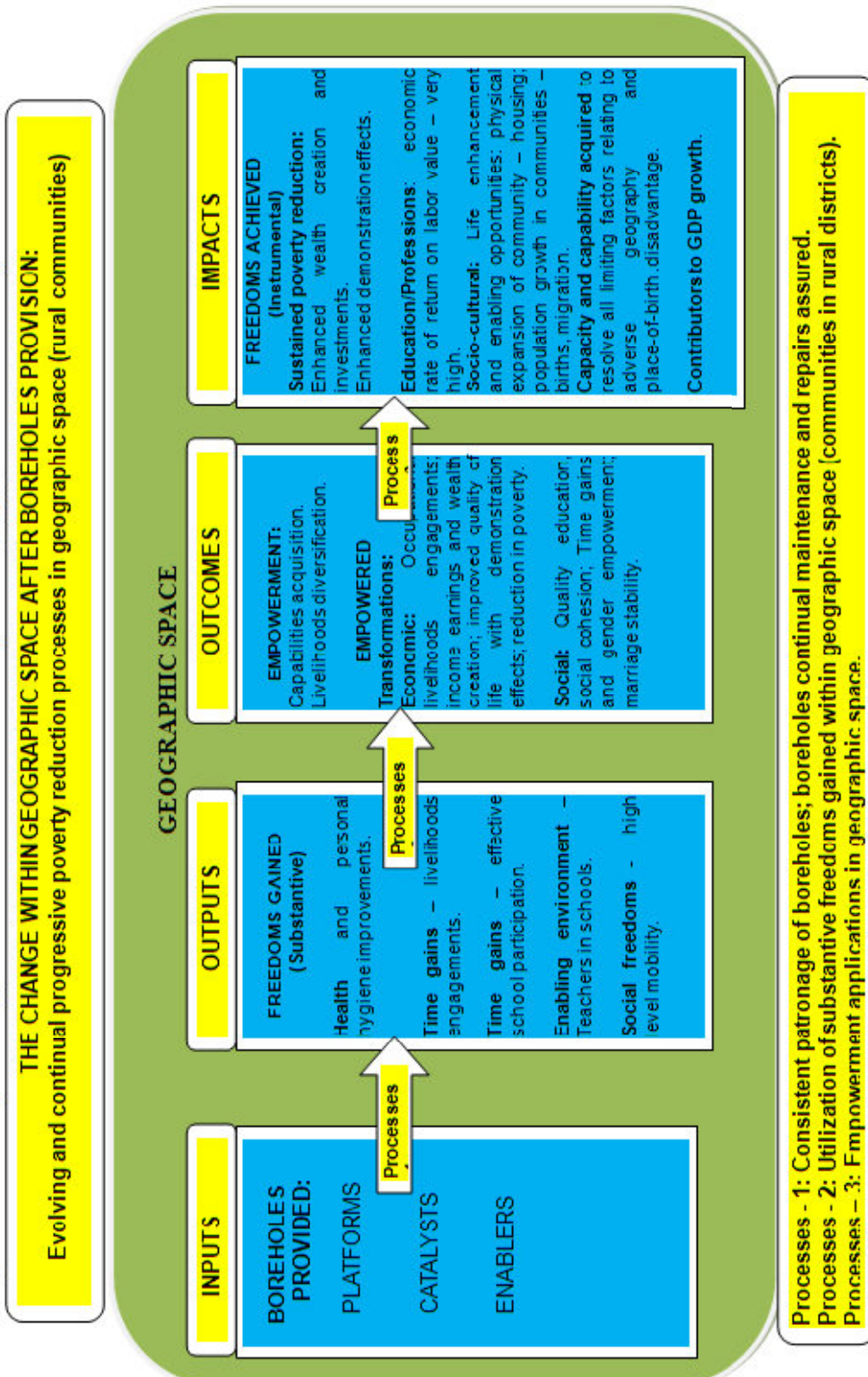


Figure 4: The Theory of Change: The Freedoms Platform Concept in Geography and in Rural Development - Model 2



5. Discussions

Practical application of models as Contribution to knowledge

According to Finn (2005:13), “the key issues used when defining the expected standard of a PhD degree are ‘independence’, ability to contribute to knowledge, being original and the research outcome being publishable material.”

Though the nature of contribution to knowledge may vary across disciplines, to be able to make a significant contribution to knowledge, the student-researcher should focus at the boundaries of existing knowledge, and typical of the new contribution that emerges should be a contribution to the theoretical or conceptual development of the research discipline (Bornstein, 2006; Wolfe, 2006; Finn, 2005).

Dilating on ‘originality’ Finn (2005:18-20) is of the view that “originality does not occur only by flashes of inspiration. It often happens that one arrives at the end of a project before one is able to take the measure of how original the contribution is, and thus illustrating the point that originality is a by-product of quite ordinary scholarly activity. It arises by itself, uninvited. All that one has to do is to recognize it when it emerges and give it full scope.” In this discourse however, while I agree to some extent with Finn that “originality can be a by-product of quite ordinary scholarly activity” I want to be very emphatic that with the CASED Theory approach, originality can consciously be evoked and perfected like how an artist or a carver makes great effort to produce a reality of the conception in his/her mind. The product thus born is not a by-product but a unique, homogeneous product, with a distinct identity, and which can exist on its own in time and space.

While according to Petre & Rugg (2010), the debate on this topic relates to what some universities term as ‘significant contribution to knowledge’ meaning ‘addition to knowledge’ in terms of content and trajectory of the contribution to knowledge this discourse on the CASED Theory relates mainly to the pivotal issue of the process of generating the contribution to knowledge and it being novel or original.

As already indicated, contributing to knowledge in a PhD thesis development starts from appropriating and applying the impacts of the theory of change. These impacts are tested with the four axis of the Transformative research paradigms - axiology; methodology; epistemology; and ontology. The ontology (reality) that emerges is further tested through the CASED Theory model and this causes the emergence of new knowledge through the epistemological metamorphosis process which transforms technical knowledge into metaphysical or philosophical structure, and which the CASED Theory simultaneously tests for originality. In this particular study, the axiology or ethics relating to the research topic were the issues of social justice and human rights including gender issues.

In terms of methodology, conventional research methods and techniques were employed to collect and analyze data/information as already indicated. The epistemology from the study related to a comparative review and analyses of literature, and the empirical data/information gathered through the field surveys. The new knowledge generated after the data interpretation reflected as Outcomes in the theory of change/conceptual model as depicted in Figure 4.

The Impacts as shown in the theory of change in Figure 4, relates to the ontology or the new emerging realities which are objective/universal realities. These are the responses to social justice/human rights issues addressed as a result of project interventions (boreholes) provided overtime. While the counterfactual evidence reinforces the status quo in the Control communities or communities without project interventions.

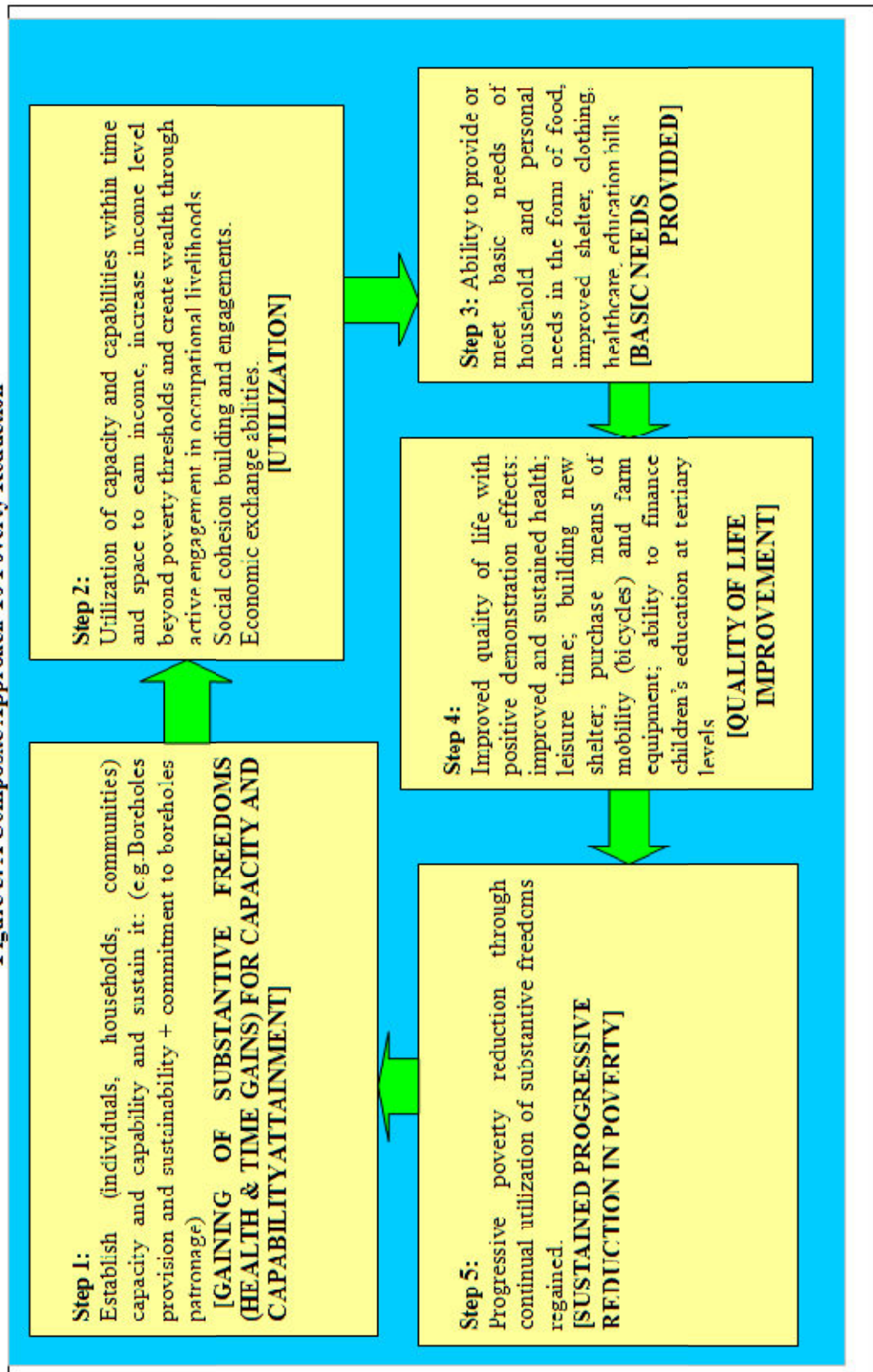
As shown in Figure 5, where boreholes have been provided and social justice/human rights issues addressed relates to ill-health due to previous patronage of disease-infected surface water sources, and regained health of community populations applied to occupational livelihoods to earn income to break from the opportunistic and occupational poverty traps, emergence from poverty, improved quality of life, and progressive emergence from poverty.

Basic needs in households are also provided as demonstration effects of the high level and intensity of boreholes patronage. Children freed from the tedium of trekking in search of water for their households at the expense of school-time now attend and participate in school regularly and have effective contact time with trained teachers who are also now available in rural community schools due to boreholes being available. Women, on who primarily lay the burden of providing water for their homes are also now freed from the daily chore and tedium of extensive trekking in search of water and usefully employing the time gains to occupational livelihoods to earn income (Blackden & Wodon, 2006; Bamberger, 2001).

Economic justice/freedoms as characterized by substantive freedoms re-gained and applied at occupational livelihoods; occupational poverty eradication; wealth creation; improved quality of life; break from the poverty trap; emergence from poverty; progressive reduction in poverty; massive contribution to national GDP growth.

Environmental congeniality: harsh effects of the physical environment on human lives mitigated through boreholes provided. Human security improvements orchestrated enabling physical environment characterized by water-borne/related diseases eradicated; minimized infant and child morbidity/mortality, and increased child survival; and total eradication of opportunistic poverty. Freedoms unlimited manifest as substantive/instrumental for development within geographic space (Adow, et al, 2013).

Figure 5: A Composite Approach To Poverty Reduction



6. Conclusions

Like an artist or a carver, student-researchers will have to work with their past and present experiences and insights to produce new things which can be considered as unique, novel and unparalleled in their subject area, and which is a requirement by universities in terms of making unique contributions to knowledge development in a specific discipline. Further, I am of the firm view that ‘contribution to knowledge’ and ‘Originality’ in doctoral thesis development usually emerge through evaluation or extensive review of literature, analysis of empirical data combined with hard critical thinking, and a sustained flame of inspiration.

It also constitutes a personal determination and commitment to move beyond technical excellence to the realm of philosophical lateralization or ‘thinking-out-of-the-box’ to contribute to knowledge deemed as being at the cutting-edge of the specific academic discipline the doctoral thesis specifically relates to, and thus, making the boundaries of knowledge in that discipline a little more elastic.

The more than enough evidence adduced from this discourse to illustrate and prove the CASED Theory ascertains its validity. It is also verifiable through both experimental and non-experimental research designs. It can also be applied irrespective of which research methodology is employed – quantitative, qualitative or integrated or mixed. It shows how pragmatic ‘Contribution to knowledge’ can be in the development of a PhD thesis, and with it emerges spontaneously ‘Originality/novelty’ through the metamorphosis of knowledge at the Evolution and Distillation process stages.

This study further proves that there should be no shade of doubt, confusion or ambiguity about what constitutes ‘Contribution to knowledge’, which in its philosophical structure and standard (as generated through the Transformative research paradigm), should stand separately from the technical results churned-out as empirical data/information. These results are, more often than not, mistakenly packaged for the audience at PhD defences as contribution to knowledge, but which in nature and nomenclature should be labeled as ‘Field Reports’. The ‘Contribution to knowledge’ also emerges with new reality – an ontology which is privileged and cannot be compromised because it constitutes universal truth which if embraced can promote the well being of humanity on a global scale.

It is hoped that students-researchers who employ and apply the CASED Theory will be filling the gap between presentation of technical field results and translating those results into actual and more philosophically-based ‘Contribution to knowledge’ which is ‘original’, and on the cutting edge of the knowledge boundaries of their subject disciplines.

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